BROWNFIELD REDEVELOPMENT ASSESSMENT REPORT

FOR

FORMER DETROIT GAS STATION

3445 W. Warren Avenue

Detroit, Michigan 48208

MIB000000120

December 20, 2005

REPORT PREPARED BY: _____ DATE: _____

Nabil Seif, Investigation Team Leader

REVIEWED AND APPROVED BY: _____ DATE: _____

George Jackson, Chief
Site Evaluation Unit
Superfund Section
Remediation and Redevelopment Division
Michigan Department of Environmental Quality
P.O. Box 30426
Lansing, Michigan 48909

TABLE OF CONTENTS

FIGURES

TABLES

APPENDICES

EXECUTIVE SUMMARY

The Michigan Department of Environmental Quality (MDEQ) was contracted via a cooperative agreement with the United States Environmental Protection Agency to conduct Brownfield Redevelopment Assessments (BFRAs). BFRAs are conducted to provide information on brownfield properties where potential environmental contamination may be acting as an impediment to future redevelopment activities. They are also conducted to determine if the property is a facility as defined in Part 201, Environmental Remediation, of the Natural Resources and Environmental Protection Act, 1994 PA 451, as amended (Part 201) and to provide recommendations for addressing issues during redevelopment. A facility is an area that contains a hazardous substance at a concentration that exceeds residential cleanup criteria established in Section 20120a(1)(a) or (17) of Part 201. File and data searches and environmental sample collection and analyses are used to obtain the needed information to make the determination and recommendations.

This BFRA report is written for the purpose of providing information on the property that will encourage redevelopment in a way that ensures protection of the public health, safety, welfare, and the environment. This information is intended for use by the local unit of government, the MDEQ, potential developers, and anyone who may become involved in the future redevelopment of the property. The report includes a summary of the property background, assessment procedures, results, conclusions, and recommendations. The conclusion as to whether the property is a facility as defined in Part 201 is made by comparison of sample concentrations of hazardous substances to state cleanup criteria established under Part 201.

A request was submitted by the city of Detroit, Department of Environmental Affairs to conduct a BFRA of the Former Detroit Gas Station Property, 3445 W. Warren Avenue, Detroit on July 12, 2005. The property is located in the city of Detroit and has a potential for being contaminated due to leaking underground storage tanks (USTs) that still exist on the property. Previous uses of the property include a delivery service, a dwelling, a furniture store, and a gas station since 1977. Property history information was not found for the period between 1977 and 1997. In 1997, the property tax reverted to the State of Michigan from its previous owner, Mr. Samuel Jolly, and is currently being held by the Michigan Land Bank, Department of Labor and Economic Growth.

The field sampling event was conducted on September 7, 2005, and included the collection of four surficial soil and ten soil boring samples. An electromagnetic survey was conducted prior to the investigation to determine the location of the USTs. Photographs of general property conditions were taken along with Global Positioning System data to determine sample and feature locations.

Analysis of the soil boring samples detected the presence of benzene, ethylbenzene, 1,2,4-trimethybenzene, 1,3,5-trimethylbenzene, n-propylbenzene, and xylenes at

concentrations greater than the Residential and Commercial I Drinking Water Protection. Benzene, ethylbenzene, 1,2,4-trimethybenzene, 1,3,5-trimethylbenzene, n-propylbenzene, and xylenes were detected above the Industrial and Commercial II, III, and IV Drinking Water Protection Criteria. Ethylbenzene, 1,2,4-trimethybenzene, 1,3,5-trimethylbenzene, naphthalene, and xylenes were detected above the GSI Protection Criteria. The highest concentrations of ethylbenzene, 1,2,4-trimethybenzene, 1,3,5-trimethylbenzene, n-propylbenzene, and xylenes were detected in SB6 which was collected adjacent to the USTs at approximately 6.5 feet. The highest concentrations of benzene and naphthalene were detected in SB5 within the first foot of soil which was collected adjacent to the pump island located in the middle of the property. Due to the elevated levels of contaminants above Part 201 criteria, the property meets the definition of a facility as defined in Part 201.

Surficial soil samples and soil boring samples were analyzed for 25 different metals and cyanide. Part 201 Drinking Water Protection Criteria and GSI Protection Criteria for aluminum, cobalt, chromium (total), iron, lithium, magnesium, and manganese were frequently exceeded in most samples. However, most of these metals were within the range of typical Michigan soils, as provided in the Michigan Background Soil Survey 2005 (MBSS). Mercury and zinc were detected only in SS1 at concentrations above the GSI Protection Criteria, the statewide default background level, and the MBSS range. Zinc was present in SS1 and SB5 at concentrations above the GSI Protection Criterion. Mercury was present in SB5 above the GSI Protection Criterion. The drinking water and the GSI pathways are not considered relevant for this site. The drinking water pathway is not considered relevant because the Detroit area is provided with drinking water by the Detroit Municipal Water Supply System and the aquifer is protected from contamination by a thick clay layer. The GSI pathway is not considered relevant for this site since the nearest water body, the Detroit River, is located 14 miles away.

Based on the findings of the BFRA, the MDEQ staff recommends that the following issues be addressed before, or during, the redevelopment of the Former Detroit Gas Station Property:

- Before redevelopment of the property, the USTs should be removed and the contaminated soils around these tanks should be removed to minimize the risk of contaminant migration or exposure. Additional investigation in these areas is needed to delineate horizontal and vertical contamination above the Part 201 Criteria, including direct contact criteria and indoor air inhalation criteria.

- Gasoline contamination needs to be re-evaluated after the USTs are removed. If all gasoline contaminants are not removed below Part 201 criteria, then use restrictions appropriate for the remaining exposure pathways and levels need to be implemented to prevent exposure to remaining contamination.

- Since the property is not fenced and access to the property is not restricted, access to the property should be restricted during tank removal and the

remediation of contaminated soils to protect people entering the property from possible physical and chemical hazards.

- The contaminants of concern should be considered with respect to responsibilities that may exist under Part 201. The nature of any response activity that may be required is dependent on the intended use of the property and the party's liability under Part 201. A person who is liable for the contamination is required to complete cleanup of the property consistent with the cleanup criteria. The relevant criteria are a function of the intended property use, such as residential, commercial, or industrial. A non-liable developer is not required to implement cleanup to achieve the appropriate cleanup criteria. However, a non-liable party must comply with the "due care" provisions specified in Section 7a obligations of Part 201. These obligations include not exacerbating the existing contamination, exercising due care to assure there are not unacceptable exposures, and taking reasonable precautions against the reasonably foreseeable activities of third parties.

- Further information concerning Part 201 cleanup criteria, due care provisions, and remedial and/or removal activities may be obtained from the MDEQ, Remediation and Redevelopment Division, Warren Office at 586-753-3700.

INTRODUCTION

The Michigan Department of Environmental Quality (MDEQ) was contracted via a cooperative agreement (CA) with the United States Environmental Protection Agency (U.S. EPA) to conduct Brownfield Redevelopment Assessments (BFRAs). BFRAs are performed to fulfill the Targeted Brownfield Assessment (TBA) task in the Section 128(a) CA. The Section 128(a) CA was entered into between the MDEQ and the U.S. EPA as a result of the "Small Business Liability Relief and Brownfield Revitalization Act" amendments to the Comprehensive Environmental Response, Compensation, and Liability Act of 1980 (Title 42 of the United States Code, Section 9601). A brownfield property is a real property, usually an abandoned, idled, or under-utilized industrial or commercial property, or a portion thereof, where the presence or potential presence of a hazardous substance, pollutant, or contaminant may be acting as an impediment to expansion, redevelopment, or reuse of the property. Properties targeted for the TBA task are those brownfield properties that have an active potential for expansion, redevelopment, or reuse.

BFRAs are intended to provide information on such properties where potential environmental contamination may be acting as an impediment to future redevelopment activities. The MDEQ staff conduct environmental investigations of brownfield properties to determine the types and locations of past and present activities, potential relevant migration pathways of concern, types and concentrations of potential contaminants, and the need for remedial and/or removal actions on the property. These findings are summarized in this BFRA report along with the determination of whether the property meets the definition of a facility as defined in Part 201, Environmental Remediation, of the Natural Resources and Environmental Protection Act, 1994 PA 451, as amended (Part 201). A facility is an area that contains a hazardous substance at a concentration that exceeds residential cleanup criteria established in Section 20120a(1)(a) or (17) of Part 201.

As part of the BFRA, property specific environmental migration pathways are evaluated for potential exposure routes and relevancy with regard to Part 201. These pathways are evaluated to determine the potential risks posed by elevated levels of hazardous substances in those pathways. As stated in Part 201, a relevant pathway means an exposure pathway that is reasonable and relevant because there is a reasonable potential for exposure to a hazardous substance to occur to a human or nonhuman receptor from a source or release of a hazardous substance. The components of an exposure pathway are a source or release of a hazardous substance, an exposure point, an exposure route, and, if the exposure point is not the source or point of release, a transport medium. The existence of an exposure control measure, exposure barrier or other similar feature, such as a municipal water supply, does not automatically make an exposure pathway irrelevant.

A BFRA of the Former Detroit Gas Station Property was conducted in accordance with the CA with the U.S. EPA. The BFRA included file and information searches, a reconnaissance inspection of the property, an electromagnetic survey of subsurface conditions, the collection of surficial soil, and subsurface soil samples, Global Positioning System (GPS) data collection of sample locations and property features, and the collection of site feature photographs.

PROPERTY BACKGROUND

Property Description

The Former Detroit Gas Station Property is located at 3445 W. Warren Avenue, Detroit, Michigan 48208, Wayne County. The property is located in a mixed residential and commercial area. The property is bordered to the north by W. Warren Avenue, to the west by 24th Street, to the east by a residence, and to the south by an alley, another residence, and a vacant lot. The property coordinates are: Latitude (North) 42° 20′ 42″ and Longitude (West) 83° 6′ 2.2″. The property is approximately three tenths of an acre. See Figure 1 for the Property Location map. The distance to the nearest surface water body, the Detroit River, is approximately 14 miles.

Property History

According to Sanborn Maps, in 1897, the property was divided into three parcels with a dwelling observed on the middle parcel. In the 1919 map, the dwelling on the middle parcel was marked F, Flat (as used to designate a delivery service), another building had been built on the eastern parcel and was marked F also. In the 1921 map, the western and the middle parcels were combined together and the building on the middle parcel was converted to a dwelling. Between 1921 and 1950, a building marked S (Store) was added to the north side of the dwelling on the middle parcel and a filling station was added on the northwest corner of the western parcel. In the 1957 map, the filling station was replaced with a furniture store. In the 1961 map, the structures on the property remained the same as before. Some time between 1961 and 1977, all the structures on the property were demolished and a concrete block and steel frame building (believed to be a gas station) was built on the southeast corner of the property. In 1997, the property tax reverted to the State of Michigan, by its previous owner, Mr. Samuel Jolly, and is currently being held by the Michigan Land Bank, Department of Labor and Economic Growth.

In an aerial photo dated 2000, the building no longer exists and the property is vacant. According to the Environmental Data Resources Inc., the Standard in Environmental Management Information Report for the Former Detroit Gas Station Property, three 8000 gallon gasoline tanks were listed as being present on the property. In the MDEQ, UST Database, the installation date of these tanks is unknown. On August 4, 2005, an electromagnetic survey (EMS) conducted by the MDEQ, Remediation and Redevelopment Division (RRD), Geological Service Unit confirmed the presence of the three USTs on the property. These tanks are believed to be the main source of contamination on the property.

A request was submitted by the city of Detroit, Department of Environmental Affairs to conduct a BFRA of the Former Detroit Gas Station Property on July 12, 2005.

The BFRA of the Former Detroit Gas Station Property was conducted to assist the city of Detroit with their redevelopment plans for the property. The State of Michigan, as owner of the property, plans to transfer the property to the city of Detroit. There has been an inquiry from a local non-profit group to redevelop the property into non-profit mixed residential and commercial use. However, potential environmental contamination concerns associated with the gasoline filling station and the USTs at the property is a major consideration in the redevelopment process. The BFRA of the property was conducted to determine these concerns.

If this property can be redeveloped, it will provide local construction job opportunities and the new development will be value added to this economically depressed area of Detroit. According to Governor Granholm; “Returning abandoned and contaminated properties to a productive use that will create jobs and increase local revenues is key to Michigan’s environmental and economic progress and is a central theme in my Jobs Today Program”.

PROCEDURES AND RESULTS

Reconnaissance Inspection Observations

A BFRA property reconnaissance was conducted at the Former Detroit Gas Station Property on August 9, 2005. The purpose of the reconnaissance was to gather information to be used in development of the BFRA sampling plan, to determine appropriate health and safety requirements, and to determine potential sampling locations. The team documented the features, known and potential source areas, debris types located throughout the property, and identified the environmental concerns associated with each area of concern. During this inspection, the property was screened with appropriate safety equipment, including a photoionization detector, a 4-gas (combustible gas/O_2/H_2S/CO) meter, and a radiation detector to determine on-property health and safety issues. The instruments did not detect any hazardous conditions on the property above background levels. Known/suspected areas of concern, based on the field observations from the property reconnaissance, include the following:

- Stained surface soil areas.
- Areas around the location of former pumps and bays.
- Subsurface areas around the USTs.

On September 7, 2005, a sampling inspection reconnaissance was conducted at the Former Detroit Gas Station Property for the purpose of identifying the actual sample locations prior to collection of the samples. This reconnaissance was also conducted to determine whether there were any changes in the conditions or features of the property.

The Former Detroit Gas Station Property is a vacant parcel located at the southeast corner of Warren Avenue and 24th Street in the city of Detroit. Most of the property area is paved with concrete and asphalt except the south-east portion of the property which is covered by grass and weeds. There are two pump islands located on the property facing Warren Avenue, and one pump island facing 24th Street. Three USTs tank covers and three fill pipe covers are visible on the surface of the property. A utility pole is located on the northwest corner of the property. A residence is located adjacent to the east of the property. An alley and another residence are located to the south of the property. See Figure 2 for the Property Features map. Photographs of the Former Detroit Gas Station Property were taken during the BFRA and are provided in Appendix A.

Electromagnetic Survey Results

An MDEQ geologist conducted an EMS of the property on August 4, 2005. The subsurface investigation was completed prior to the field sampling, to aid in the

determination of sampling locations. The survey results indicated the presence of three USTs on the property. The EMS report/maps are provided in Appendix B.

Sampling Procedures and Results

The field sampling event was conducted on September 7, 2005, and included the collection of four surficial soil and ten soil boring samples from suspected areas of contamination at the Former Detroit Gas Station Property. No attempt was made to open, observe, or sample the tank contents.

These samples were collected in order to:

- Determine the levels of U.S. EPA Target Compound List compounds (organic compounds) and Target Analyte List analytes (inorganic elements) which may be present at the property.

- Characterize potential contamination in shallow and subsurface soils and groundwater on the property.

- Characterize potential contaminant source areas.

- Ascertain potential contaminant migration from possible source areas.

- Evaluate health and safety concerns, including threats posed to nearby residential populations, future workers or occupants, or natural resources associated with the different sample media.

- Evaluate and determine whether the Former Detroit Gas Station Property is a facility in accordance with the definition found in Part 201, Section 20101(o).

Standard MDEQ sample collection, preservation, and decontamination procedures, as outlined in the work plan, were followed for all samples. Sample collection and preservation followed the MDEQ, RRD, Operational Memorandum 2, Attachments 4-6. Soil samples analyzed for volatile organic compounds were field preserved with methanol. Remaining soil sample portions were not chemically preserved. Water samples (field blanks) analyzed for volatile organic compounds were field preserved with hydrochloric acid. Water samples analyzed for semi-volatile organic/ pesticide/polychlorinated biphenyl (PCB) compounds were not field preserved. Water samples analyzed for total metals were field preserved with nitric acid to a hydrogen ionization potential (pH) of less than two and water samples analyzed for amenable cyanide were field preserved with sodium hydroxide to a pH of more than twelve. Soil and water samples were analyzed for organic compounds and inorganic analytes, consistent with the MDEQ, RRD, Operational Memorandum 2, Attachment 1, utilizing the following methods:

Compound/Analyte	Analytical Method	
	Soil	Water
Volatile Organics	8260B	8260B
Semi-volatile Organics	8270C	8270C
Pesticides	8081B	8081B
PCBs	8082A	8082A
Aluminum, Antimony, Barium, Beryllium, Cadmium, Chromium, Cobalt, Copper, Lead, Manganese, Molybdenum, Nickel, Strontium, Vanadium, Zinc	6010	6020
Arsenic	7060	6020
Cyanide	OIA-1677/9010	OIA-1677/9010
Iron, Lithium	6010	6010
Magnesium	7450	7450
Mercury	7471	7470
Selenium	7740	6020
Silver	7761	6020
Sodium	7770	7770
Thallium	7841	6020

The MDEQ quality assurance/quality control procedures as outlined in the Quality Assurance Project Plan for Site Assessment and Brownfield Activities were followed (MDEQ, 2003). Upon collection of the samples, all samples were labeled and placed in shipment coolers. The interior of the shipment coolers were kept at a temperature of approximately four degrees Celsius with ice and delivered to the MDEQ Laboratory. Samples were transported by the Team Leader to the MDEQ laboratory for analysis. All the inorganic and organic soil samples (including the volatile organic analysis portions that were preserved with methanol) and all the organic water and inorganic field blank water sample were analyzed by the MDEQ laboratory. Laboratory analytical data for all the sample analyses are provided in Appendix C.

Upon analysis, laboratory results were sent to the Team Leader and then processed for this report. Contaminants exceeding the Generic Cleanup Criteria (Criteria) promulgated pursuant to Part 201 will be described in the following sections. The current Part 201 Criteria are provided in Appendix D. The Statewide Default Background Levels were used as background samples for all metals in the surficial and soil boring samples. Staff also compared metals concentrations to the typical range identified in the MBSS 2005 to make judgments about metals that appear to be naturally occurring. No property specific background sample was designated for the organic portion of the surficial soil and soil boring samples. Any surficial or soil boring sample metal concentrations above Criteria but equal to or below Statewide Default Background Levels are not considered exceedances of Criteria in this report. Any sample concentrations of naturally occurring metals above Criteria but equal to or below

the statewide default background levels are not considered exceedances of Part 201 Criteria in this report. Soil sample concentrations for metals were also compared to the typical range of data for Michigan soils in Table 1 of the MBSS document.

Surficial Soil Samples

The intent of the surficial soil sampling was to characterize potentially contaminated surficial soil or source areas, to determine the potential for possible contaminant migration, and to determine health and safety concerns, including threats posed to nearby residential populations, future workers or occupants, and resources, associated with the surficial soils at the property. To accomplish this sampling task, four surficial soil samples were collected during the BFRA. All samples were collected using stainless steel trowels from depths ranging from 0 to 12 inches below the ground surface according to the procedures outlined in the work plan.

See Figure 3 for a map showing surficial soil sample locations. For a description of the surficial soil sample locations and the sample characteristics, refer to Table 1. Table 2 provides a summary of the surficial soil sample analytical results that exceed Part 201 Criteria and lists the Criteria exceedances.

Analysis of the surficial soil samples collected during the BFRA detected the presence of metals at concentrations above Part 201 Criteria. The following lists the criteria exceedances for surficial soil samples and metals with concentrations in excess of criteria. The horizontal and vertical extent of the contaminants in the surficial soils was not fully delineated during the BFRA of the Former Detroit Gas Station Property.

Exceedances above the Soil Residential and Commercial I Drinking Water Protection Criteria

CONTAMINANTS	*CRITERIA*	*EXCEEDANCES*	*CONCENTRATIONS*	
INORGANICS	*(mg/kg)*	*In Sample Numbers*	*Ranges (mg/kg)*	*Highest In*
magnesium	8,000	SS1, SS2, SS3, and SS4	14,700-22,200	SS1

Exceedances above the Soil Industrial and Commercial II, III, and IV Drinking Water Protection Criteria

CONTAMINANTS	*CRITERIA*	*EXCEEDANCES*	*CONCENTRATIONS*	
INORGANICS	*(mg/kg)*	*In Sample Numbers*	*Ranges (mg/kg)*	*Highest In*
magnesium	8,000	SS1	22,200	SS1

Exceedances above the Soil Groundwater Surface Water Interface Protection Criteria

CONTAMINANTS	CRITERIA	EXCEEDANCES	CONCENTRATIONS	
INORGANICS	(mg/kg)	In Sample Numbers	Ranges (mg/kg)	Highest In
mercury [Total] (B, Z)	0.05	SS1	0.20	SS1
zinc (B)	170	SS1	260	SS1

Soil Boring Samples

The intent of the soil boring sampling was to characterize any potential contamination in the deep soils, to determine if any downward migration of contamination has occurred from probable source areas, and to determine the potential health and safety concerns, including threats posed to nearby residential populations, future workers or occupants, or resources, associated with the deep soils at the property. To accomplish this sampling task, ten soil boring samples were collected from ten separate boring locations during the BFRA. All samples were collected utilizing a Geoprobe® rig with a high density polyethylene lined macro core sampler from depths ranging from 4 to 8 feet below the ground surface according to the procedures outlined in the work plan. These procedures included screening the core with a photoionization detector to help determine the presence of volatile organic compounds and potential sampling points within the cores.

See Figure 4 for a map showing soil boring sample locations. A description of the soil boring locations, lithology, and sample characteristics can be found in Table 3. Table 4 provides a summary of the soil boring sample analytical results that exceed Part 201 Criteria and lists the Criteria exceedances.

Analysis of the soil boring samples collected during the BFRA detected the presence of organic compounds and metals at concentrations above Part 201 Criteria. The following lists the criteria exceedances for soil boring samples, the organic compounds, and metals with concentrations in excess of criteria. The horizontal and vertical extent of the contaminants in the deep soils was not fully delineated during the BFRA of the Former Detroit Gas Station Property.

Exceedances above the Soil Residential and Commercial I Drinking Water Protection Criteria

CONTAMINANTS	***CRITERIA***	***EXCEEDANCES***	***CONCENTRATIONS***	
VOLATILES	***(μg/kg)***	***In Sample Numbers***	***Ranges (μg/kg)***	***Highest In***
benzene	100	SB5 and SB6	130 - 180	SB5
ethylbenzene	1,500	SB6	15,000	SB6
n-propylbenzene	1,600	SB5 and SB6	3,400 – 11,000	SB6
1,2,4 - trimethylbenzene	2,100	SB6	47,000	SB6
1,3,5 - trimethylbenzene	1,800	SB6	17,000	SB6
xylenes	5,600	SB6	13,550	SB6
INORGANICS	*(mg/kg)*	*In Sample Numbers*	*Ranges (mg/kg)*	*Highest In*
aluminum	1	SB1 through SB10	9,400 – 20,000	SB8
arsenic	4.6	SB1, SB3, SB4, SB5, SB6, SB9, and SB10	6 – 12.1	SB6
cobalt	0.8	SB1 through SB10	7 - 15	SB9
iron (B)	6	SB1 through SB10	16,000 – 40,000	SB6
lithium	3.4	SB1 through SB10	19 - 34	SB6
magnesium	8,000	SB1, SB6, SB9, and SB10	10,100 – 12,500	SB6
manganese	1	SB1, SB2, SB6, SB7, SB9, and SB10	450 – 760	SB1 and SB9

Exceedances above the Soil Industrial and Commercial II, III, and IV Drinking Water Protection Criteria

CONTAMINANTS	***CRITERIA***	***EXCEEDANCES***	***CONCENTRATIONS***	
VOLATILES	***(μg/kg)***	***In Sample Numbers***	***Ranges (μg/kg)***	***Highest In***
benzene	100	SB5 and SB6	130 - 180	SB5
ethylbenzene	1,500	SB6	15,000	SB6
n-propylbenzene	4,600	SB6	11,000	SB6
1,2,4 - trimethylbenzene	2,100	SB6	47,000	SB6
1,3,5 - trimethylbenzene	1,800	SB6	17,000	SB6
xylenes	5,600	SB6	13,550	SB6

Exceedances above the Soil Industrial and Commercial II, III, and IV Drinking Water Protection Criteria (cont.)

INORGANICS	*(mg/kg)*	*In Sample Numbers*	*Ranges (mg/kg)*	*Highest In*
aluminum	1	SB1 through SB10	9,400 – 20,000	SB8
arsenic	4.6	SB1, SB3, SB4, SB5, SB6, SB9, and SB10	6 – 12.1	SB6
cobalt	2	SB1 through SB10	6.9 - 15	SB9
iron (B)	6	SB1 through SB10	16,000 – 40,000	SB6
lithium	7	SB1 through SB10	19 - 34	SB6
manganese	1	SB1, SB2, SB6, SB7, SB9, and SB10	450 – 760	SB1 and SB9

Exceedances above the Soil Groundwater Surface Water Interface Protection Criteria:

CONTAMINANTS	*CRITERIA*	*EXCEEDANCES*	*CONCENTRATIONS*	
VOLATILES	*(μg/kg)*	*In Sample Numbers*	*Ranges (μg/kg)*	*Highest In*
ethylbenzene	360	SB6	15,000	SB6
1,2,4 - trimethylbenzene	570	SB6	47,000	SB6
1,3,5 - trimethylbenzene	1,100	SB6	17,000	SB6
xylenes	700	SB6	13,500	SB6
SEMI-VOLATILES	*(μg/kg)*	*In Sample Numbers*	*Ranges (μg/kg)*	*Highest In*
naphthalene	870	SB5 – SB6	1,500 – 7,000	SB5
INORGANICS	*(mg/kg)*	*In Sample Numbers*	*Ranges (mg/kg)*	*Highest In*
chromium	3.3	SB1 through SB10	15 - 26	SB2 and SB9
cobalt	2	SB1 through SB10	6.9 - 15	SB9
lithium	1.9	SB1 through SB10	19 - 34	SB6
manganese	55	SB1, SB2, SB6, SB7, SB9, and SB10	450 – 760	SB1 and SB9
mercury [Total] (B, Z)	0.05	SB5	0.79	SB5
zinc (B)	170	SB5	400	SB5

Exceedances above the Soil Residential and Commercial I Direct Contact Cleanup Criteria

CONTAMINANTS	*CRITERIA*	*EXCEEDANCES*	*CONCENTRATIONS*	*CONTAMINANTS*
INORGANICS	***(mg/kg)***	***In Sample Numbers***	***Ranges (mg/kg)***	***Highest In***
arsenic	7.6	SB1, SB3, and SB6	10.3 – 12.1	SB6

Groundwater Samples

No groundwater samples were planned during the BFRA investigation, because Detroit residents are served by the city of Detroit Municipal Water system which obtains its water from Lake Huron and the Detroit River, and because the Detroit area drinking water aquifer is protected from contamination by a thick clay layer above the drinking water aquifer.

DISCUSSION

The MDEQ staff conducted a BFRA of the Former Detroit Gas Station Property in accordance with the CA with the U.S. EPA and according to the approved work plan. The BFRA included file and information searches, reconnaissance inspections of the property, an electromagnetic survey of subsurface conditions, the collection of surficial soil, and subsurface soil samples, GPS data collection of sample locations and property features, and the collection of site feature photographs.

Analysis of the soil samples collected during the BFRA of the Former Detroit Gas Station Property indicated the presence of several metals (including aluminum, arsenic, chromium (total), cobalt, iron, lithium, magnesium, manganese, mercury, and zinc) and several common gasoline constituents (including benzene, ethylbenzene, 1,2,4-trimethybenzene, 1,3,5-trimethylbenzene, n-propylbenzene, naphthalene, and xylenes) at concentrations greater than the Generic Residential Cleanup Criteria. Because these contaminants were detected at concentrations in excess of Generic Residential Cleanup Criteria, the Former Detroit Gas Station Property meets the definition of a facility under Part 201. The metals are not attributed to gas station operations and are generally within the range of metal concentrations found in typical Michigan soils (MDEQ, 2005).

The following are the findings and recommendations regarding the presence of contaminants and redevelopment of the Former Detroit Gas Station Property:

- Benzene, ethylbenzene, 1,2,4-trimethybenzene, 1,3,5-trimethylbenzene, n-propylbenzene, naphthalene, and xylenes are present in shallow soils at concentrations greater than the Residential and Commercial I and Industrial and Commercial II, III, and IV Drinking Water Protection Criteria and GSI Protection Criteria in the soil boring samples collected from the property. Many other volatile organic and polynuclear aromatic compounds associated with gasoline contamination are also present in shallow soils at levels below all criteria. No samples were collected for these gasoline constituents for depths greater than approximately seven feet. These compounds are likely to be the result of gasoline filling station operations. Gasoline contamination needs to be evaluated after the USTs are removed and remediation oof identified contamination should be performed, if necessary. If all gasoline contaminants are not removed below Part 201 Criteria, then use restrictions appropriate for the levels of remaining contaminants and associated relevant criteria need to be implemented to prevent exposure to remaining contamination.

- Aluminum, arsenic, chromium (total), cobalt, iron, lithium, magnesium, manganese, zinc are present in excess of Drinking Water Protection and GSI Protection Criteria. These metals are usually not associated with gasoline contamination. Levels of these metals, although they may exceed the statewide

default background levels of Part 201 criteria tables, are within the typical range of soils as presented in the MBSS. Moreover, exceedance of Drinking Water Protection and GSI Protection Criteria at this site does not constitute a significant human or ecological risk since the Detroit area is serviced by municipal water and the nearest surface water to this site is approximately 14 miles away.

- Arsenic was present in several soil borings at levels above the 7.6 mg/kg direct contact criterion (7.3 and 12.1 mg/kg arsenic). These arsenic levels are within the range of background arsenic concentrations for the Huron Erie Glacial Lobe as identified in the MBSS 2005 and are therefore considered to be naturally occurring and not an exceedance of Part 201 Criteria.

- The property is not fenced and access to the property is not restricted. Trespassers could enter the property and be exposed to the physical or chemical hazards during excavation and removal of the underground storage tanks that remain on the property. Access to the property should be completely restricted during the mitigation of the contaminants in the soils, and the removal of the chemical hazards to protect against exposure to people entering the property until the clean up and the redevelopment is completed.

- The contaminants should be considered with respect to responsibilities that may exist under Part 201. The nature of any response activity that may be required is dependent on the intended use of the property and the party's liability under Part 201. A person who is liable for the contamination is required to achieve cleanup of the property consistent with the cleanup criteria. The relevant criteria are a function of the intended property use, such as residential, commercial, or industrial. A non-liable developer is not required to implement a cleanup to achieve the appropriate cleanup criteria. However, a non-liable party must comply with the "due care" provisions specified in Section 7a obligations of Part 201. These obligations include not exacerbating the existing contamination, exercising due care to assure there are not unacceptable exposures, and taking reasonable precautions against the reasonably foreseeable activities of third parties.

- Further information concerning Part 201 cleanup criteria, due care provisions, and remedial and/or removal activities may be obtained from the MDEQ, RRD, Warren Office at 586-753-3700.

BIBLIOGRAPHY

1. Michigan Department of Environmental Quality, Remediation and Redevelopment Division, Superfund Section, Site File for the Former Detroit Gas Station Property, September 2005.

2 Michigan Background Soil Survey 2005, Hazardous Waste Technical Support Unit, Hazardous Waste Section, Waste and Hazardous Materials Division, Department of Environmental Quality (http://www.deq.state.mi.us/documents/deq-whm-hw-Michigan-Background-Soil-revJuly2005.pdf).

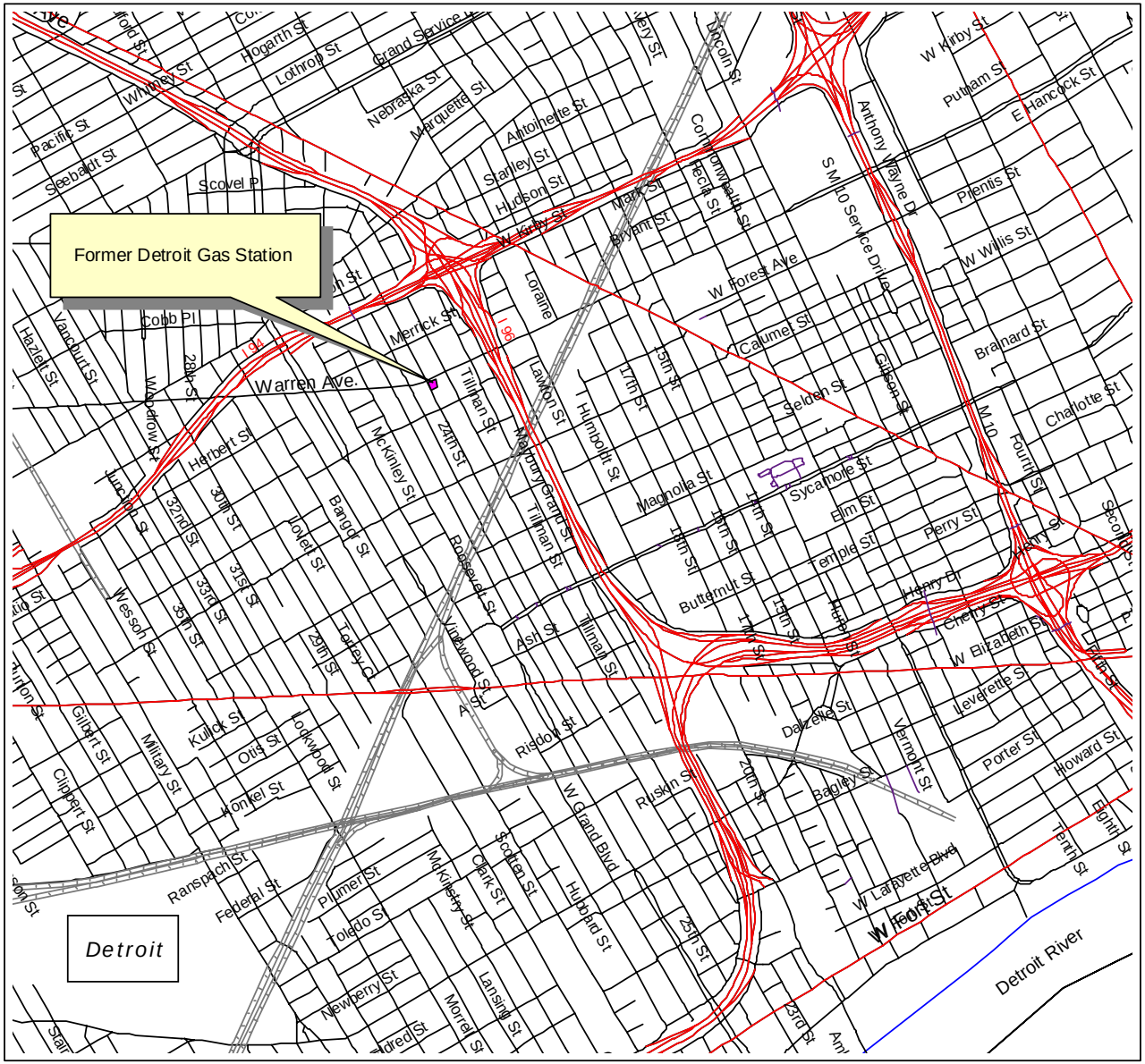
3. Sanborn Fire Insurance Maps, Former Detroit Gas Station Property, Detroit, Michigan: 1897, 1919, 1921, 1950, 1957, 1961, and 1977.

4. Topographic Maps, Detroit, Michigan: 1952 photo revised, 1968, 1973, and 1980.

5. Aerial Photography for Former Detroit Gas Station Property: 1937, 1957, 1972, 1985, 1993, and 2000.

6. The Environmental Data Resources, Standard in Environmental Risk Management Information Report for the Former Detroit Gas Station Property, July 22, 2005.

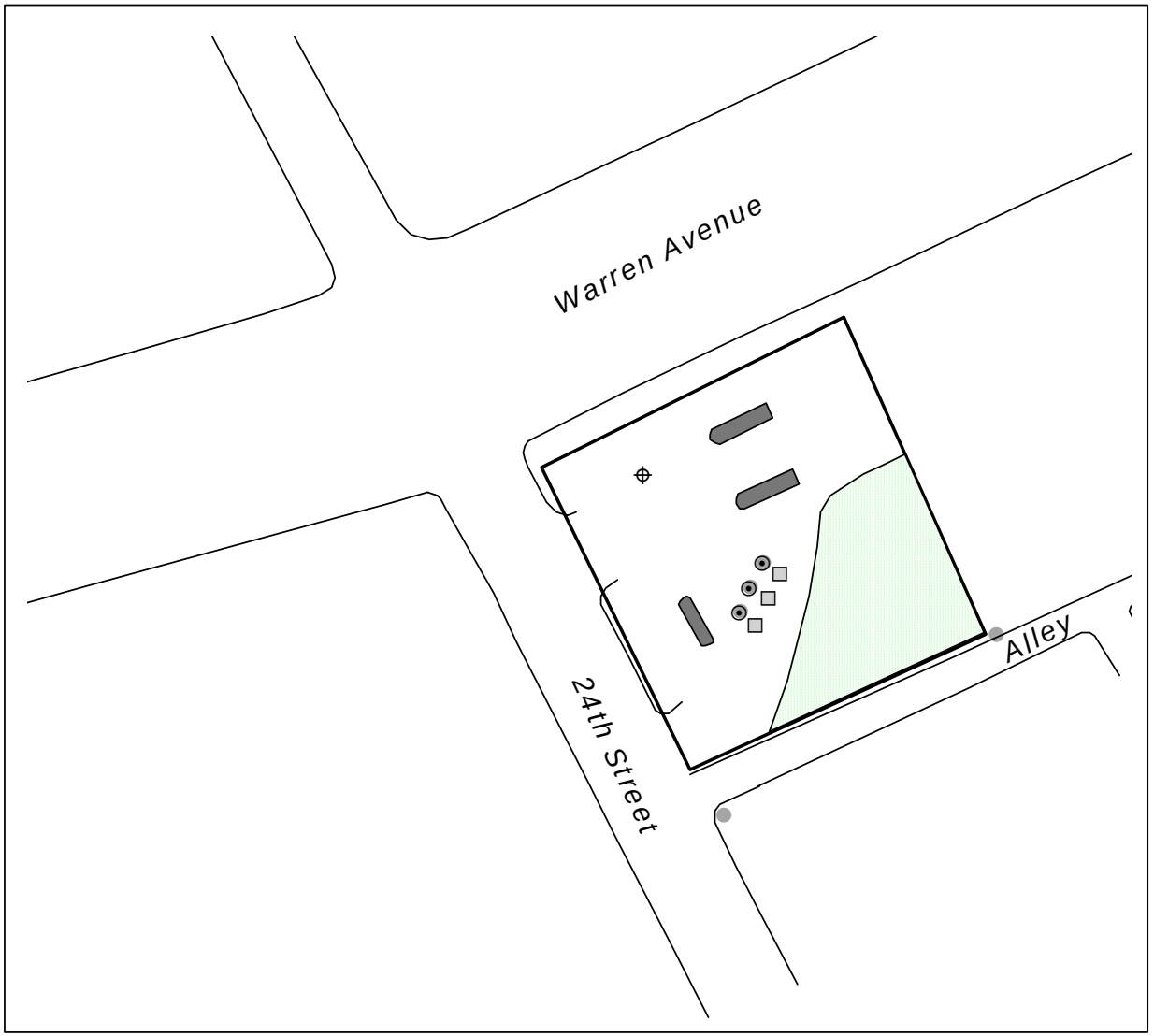
Figure 1
Property Location



Former Detroit Gas Station
3445 W. Warren Ave.
Detroit, MI 48208

EPA ID. No.:
MIB000000120

Figure 2
Property Features



Former Detroit Gas Station
3445 W. Warren Ave.
Detroit, MI 48208

EPA ID. No.:
MIB000000120

Legend

- Well
- Fill Pipe
- Tank Cover
- Utility Pole
- Pump Island
- Grass Area

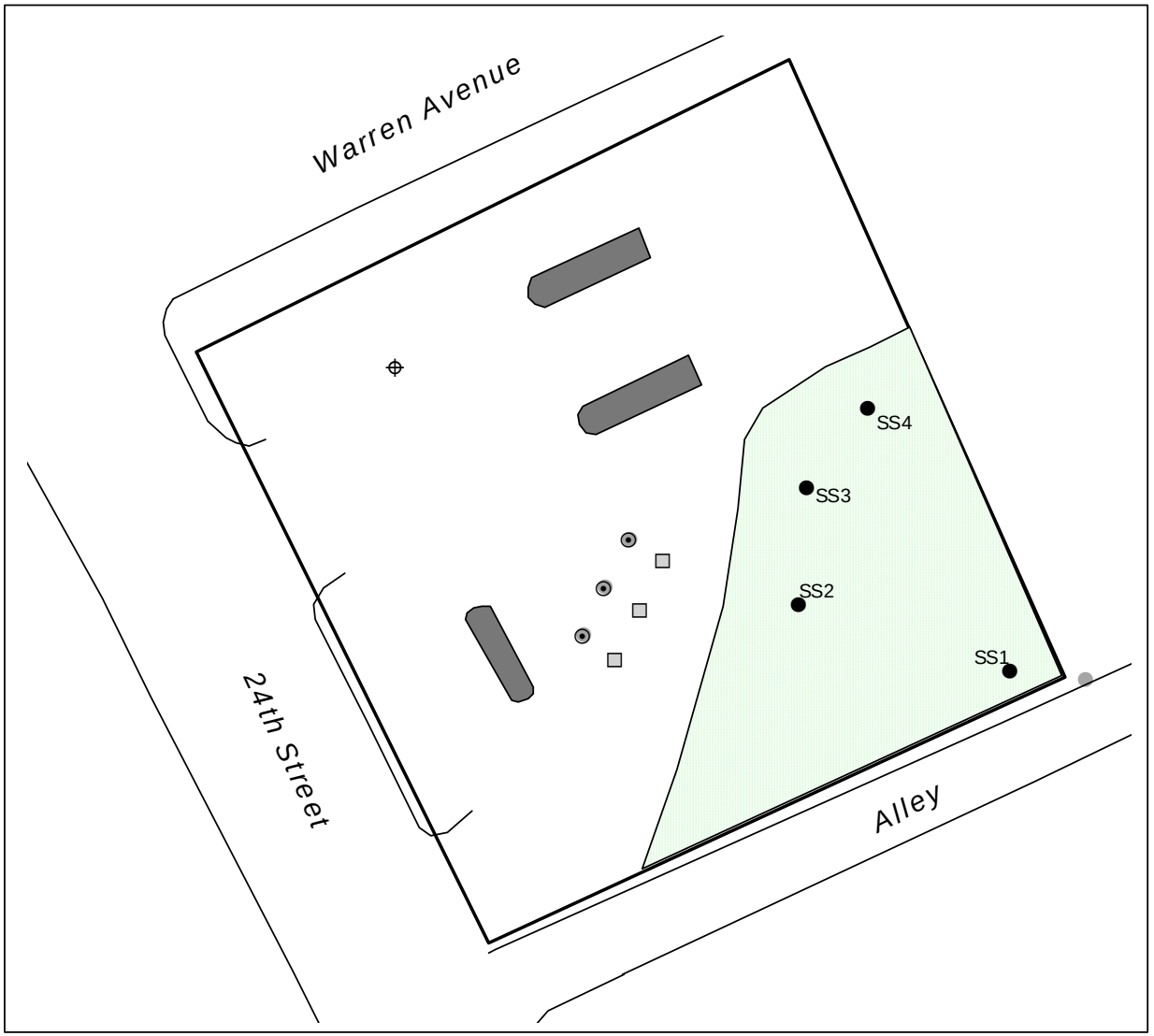
N
W E
S

30 0 30 Feet

Department of Environmental Quality
Remediation and Redevelopment Division
Superfund Section
Site Evaluation Unit

Sources: Center for Geographic Information and Global Positioning System Data
Compiled by: TAD
November 23, 2005

Figure 3
Surficial Soil Sample Locations



Former Detroit Gas Station
3445 W. Warren Ave.
Detroit, MI 48208

EPA ID. No.:
MIB000000120

Legend

● SS1 - Surficial Soil 1

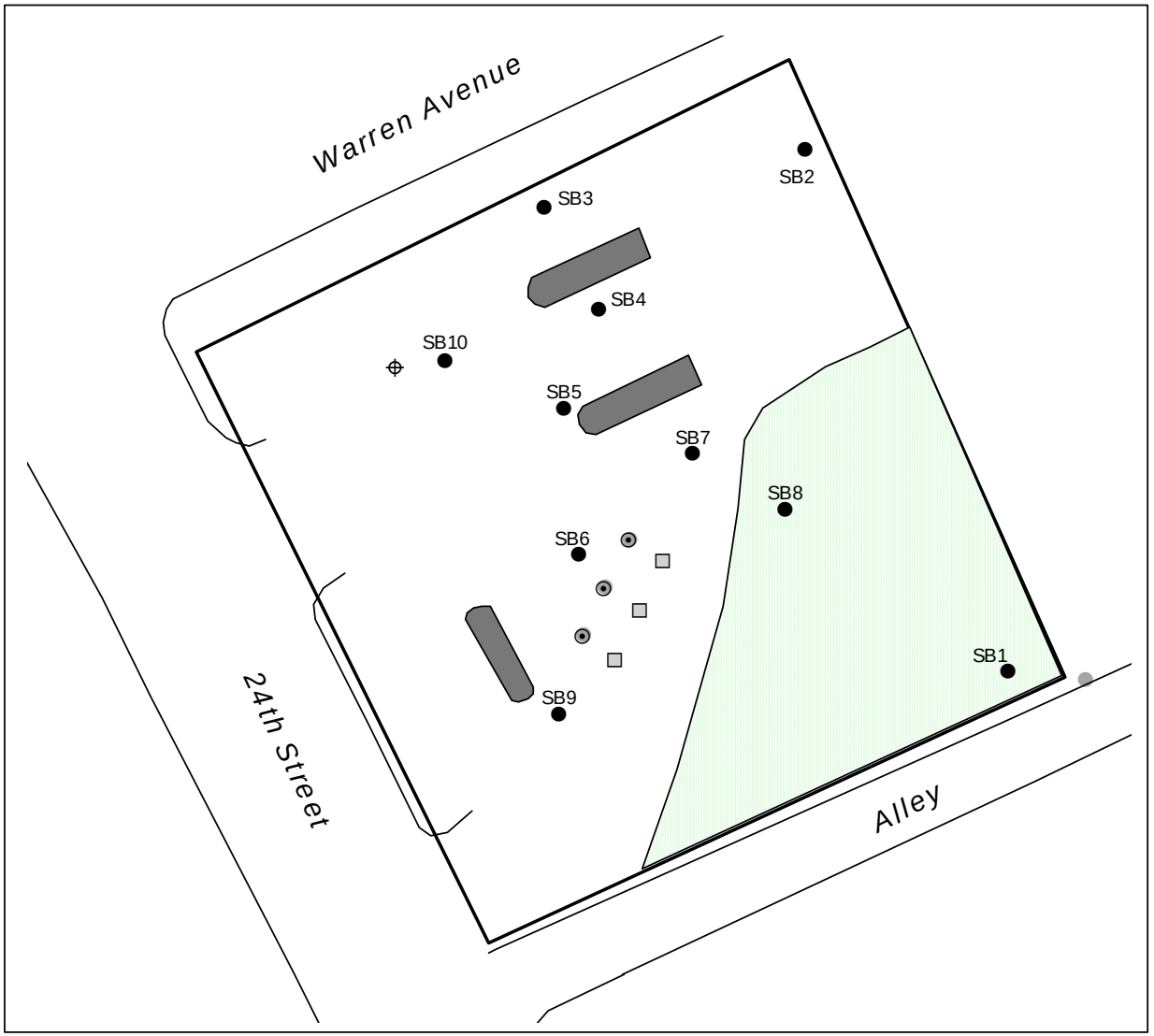
N
W E
S

20 0 20 Feet

Department of Environmental Quality
Remediation and Redevelopment Division
Superfund Section
Site Evaluation Unit

Sources: Center for Geographic Information and Global Positioning System Data
Compiled by: TAD
November 23, 2005

Figure 4
Soil Boring Sample Locations



Former Detroit Gas Station
3445 W. Warren Ave.
Detroit, MI 48208

EPA ID. No.:
MIB000000120

Legend

● SB1 - Soil Boring 1

N
W E
S

20 0 20 Feet

Department of Environmental Quality
Remediation and Redevelopment Division
Superfund Section
Site Evaluation Unit

Sources: Center for Geographic Information and Global Positioning System Data
Compiled by: TAD
November 23, 2005

Parcel Detail Report

Wayne,C:Detroit, W:12,I:665-7,S:Hubbard & Dingwall's Subdn of Lots 557-568 inc. of J.W. Johnston's sub. of the Porter & Campau F

Parcel ID: 495475

Legal Description:

Lot 34 thru 36

Local Parcel Numbers:

Date	Local Parcel Num	Type	Tax Sale Year
11/11/1811	665-7	City Of Detroit Item N	
11/11/1811	13656	Sale Number	1996

Document List:

Doc Num	Doc Date	Transaction	Doc Type	Inv. Action	Sur%	Min%	O Rts	Party	Rev Doc Cmt	Doc ID
509607	5/13/2005	State Admin Board Transfer		Disposal	100.00	100.00		Michigan Land Bank Fast Track		2032056
181445	5/6/1997	Tax Reverted		Acquisition	100.00					384291
113571	6/15/1979	Public Use		Disposal	100.00	0.00		City of Detroit,		421083
123544	5/5/1978	Tax Reverted		Acquisition	100.00	100.00				261956

Parcel Rights:

Right Name	Right %	Reservation	Period	Expiration	Reversion	Period	Revert Date
Surface	0.00						
Mineral	100.00						

Locator Description:

County: Wayne Acreage: 0 Whole Lots: 3 Fraction Lots: 0 Parcel Type: Platted

Street Name and Direction: Warren S

Jur ID	Jur Type	Jurisdiction Name
550	City	Detroit

Town	Range	Section	QQ	Q	Acreage

Pvt Claim Acreage	Whole Lots	Fraction Lots

Parcel Information

Parcel id: 495475 Category: Retained Building: Created By: DB2ADMIN 11/17/1999

Parcel State: Active Project Use: Undedicated Water Frontage: Updated By: DB2ADMIN 7/8/2004

Admin Agency: DNR Project Name: UNDEDICATED Env. Status: Data Source: MDL

Cert. Num:

Fund Information:

Doc Num	Doc Date	Trans Code	Inventory Action	Fund %	Fund Code	Fund Name	Doc ID

Comments:

Type	Comment By	Doc ID	Comment
Parcel	DB2ADMIN 11/9/2002		1/00 HOLD PER KAREN KLIGMAN, DEQ.